Re: 1−1/2+1/3−1/4+1/5−1/6+1/7

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- *From*: G. Frege <nomail@invalid>
- *Date*: Wed, 13 Feb 2008 20:57:33 +0100

On Tue, 12 Feb 2008 21:42:19 +0100, G. Frege <nomail@invalid> wrote:

> [...] Anyway here is a simple formalism concerning the notion
> of /limit/ for sequences of sets: [...].

And that approach becomes even simpler if we are dealing with /monotone/
sequences of sets.

If (E_n) is an /increasing/ sequence of sets, i.e. E_n c E_(n+1) for all
n e N, then the limit exists, and we have

lim E_n = U E_n.
n n

If (E_n) is an /decreasing/ sequence of sets, i.e. E_(n+1) c E_n for all
n e N, then the limit exists, and we have
_
lim E_n = | | E_n.
n n

So it's extremely easy to determine the limit of the sequence in this
cases. (Just calculate the union or intersection of all E_n − that's
all.)

Example:

Let's consider the sequence of sets (S_n) with

S_n := {m e N : m < n} (n e N).

Then

S_0 = {}
S_1 = {0}
S_2 = {0,1}

S_3 = {0,1,2}
: ,

and, of course, S_n c S_(n+1) for for all n e N. With other words, (S_n) is an increasing sequence of sets.

Now it's easy to "see" (i.e. prove) that

U S_n = N = {0,1,2,...}
n

Hence

lim S_n = N.
n

F.

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